

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of claims:

1-77. (Cancelled)

78. (Original) A method for entangling a quantum state of a first qubit with a quantum state of a second qubit, the method comprising:

(A) tuning a ground state energy difference between a potential energy state of said first qubit and a potential energy state of said second qubit so that the energy difference corresponds to a predetermined frequency; and

(B) biasing a resonant control system, which is capacitively coupled to said first qubit and second qubit, to said predetermined frequency for a period of time.

79. (Original) The method of claim 78, wherein said resonant control system comprises a Josephson junction and a bias current source that is connected in series with the Josephson junction, and wherein said biasing comprises adjusting said bias current source.

80. (Original) The method of claim 79, wherein said bias current source is $0.994 \cdot I_c$ or less during said biasing.

81. (Original) The method of claim 79, wherein said bias current source is $0.990 \cdot I_c$ or less during said biasing.

82. (Original) The method of claim 78, the method further comprising:

(C) applying a first quantum gate to said first qubit prior to said tuning (A);
and

(D) applying a second quantum gate to said first qubit after said tuning (A).

83. (Original) The method of claim 82, wherein said first quantum gate is a Hadamard gate and said second quantum gate is a Hadamard gate.

84. (Original) The method of claim 78, the method further comprising:

(C) applying a first quantum gate to said second qubit prior to said biasing (B);
and

(D) applying a second quantum gate to said second qubit after said biasing
(B).

85. (Original) The method of claim 84 wherein said first quantum gate is a Hadamard gate and said second quantum gate is a Hadamard gate.

86. (Original) The method of claim 78, wherein said first qubit, said second qubit, or both said first and second qubit are described by a native interaction Hamiltonian that comprises an off diagonal interaction term.

87. (Original) The method of claim 86, wherein said first qubit, said second qubit, or both said first qubit and said second qubit are a superconducting charge qubit.

88. (Original) The method of claim 78, wherein said first qubit, said second qubit, or both said first qubit and said second qubit are described by a native interaction Hamiltonian that comprises a diagonal interaction term.

89. (Original) The method of claim 88, wherein said first qubit, said second qubit, or both said first qubit and said second qubit is a charge qubit, a phase qubit, or a flux qubit.

90-122. (Cancelled)